UNIT INSTRUCTIONS

TD-115
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LOW-VOLTAGE POWER SUPPLY 429B-1

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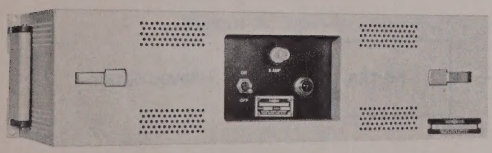

C220-77P

Figure 1. Low-Voltage Power Supply 429B-1

1.1 APPLICATION AND DESCRIPTION.

The Low-Voltage Power Supply 429B-1 provides several outputs of relatively low voltage. Among them is an a-c output of 12.6 volts, an unfiltered d-c output of +28 volts, a partly filtered d-c output of +28 volts, and one filtered d-c output each of -90, +28, +130, and +250 volts.

The unit, figure 1, is constructed for mounting in a standard 19-inch open-type rack. The chassis is hinged so that it can be swung out for maintenance. A metal cover, secured by thumb-release fasteners, provides protection of the unit. Forced air cooling is used for the unit.

1.2 TECHNICAL CHARACTERISTICS.

Weight	23 pounds
Size	5-1/8 inches high, 18-7/8 inches wide, 7 inches deep
Warmup period	None
Voltage input	115/230 volts a-c single phase
Power input	185 watts
Power output	+250 volts d-c filtered at 37 ma +130 volts d-c filtered at 315 ma +28 volts d-c unfiltered at 1.5 amp +28 volts d-c partly filtered at 580 ma +28 volts d-c regulated at 180 ma -90 volts d-c filtered at 6 ma 12.6 volts a-c at 5.2 amp

1.3 SEMICONDUCTOR AND FUSE COMPLEMENT.

Table I lists all semiconductors and the fuse used in the Low-Voltage Power Supply 429B-1. Their reference symbols, type, and functions are also listed.

TABLE I. SEMICONDUCTOR AND FUSE COMPLEMENT

SYMBOL	TYPE	FUNCTION
CR1 thru CR4	1N1084	+250-volt rectifiers
CR5	1N1084	-90-volt rectifier
CR6 and CR7	1N1086	+28-volt rectifiers
CR8	1N1084	Isolation diode
CR9	1N1361A	Voltage regulator
F1	3-amp Slo Blo	Line protection

2.1 CIRCUIT DESCRIPTION.

Figure 2 is a block diagram of the Low-Voltage Power Supply 429B-1. The input voltage is applied to the primary of transformer T1 through S1. The secondary of the transformer is connected to the rectifier circuits. As shown in the block diagram, the power transformer supplies all the rectifier circuits. Schematic diagram, figure 6 shows the actual connection of the transformer secondary to the rectifiers. The +250-volt supply uses a full-wave bridge rectifier and a choke input filter. The +130-volt supply is connected to the center tap of the +250-volt supply and contains an LC filter. Indicator light DS1 is tied across the 12.6-volt a-c supply. The unfiltered +28-volt supply is taken from directly across the full-wave rectifier diodes CR6 and CR7. The partly filtered +28-volt supply is taken from across a one-section LC network. The filtered, regulated 28-volt d-c supply is isolated from the other 28-volt d-c supplies by diode CR8. This prevents C4 and C6 from discharging into the low impedance of the other supplies. After passing through an RC filter, the output voltage is clamped by Zener diode CR9 which conducts when the voltage across it rises above 27 volts d-c. The -90-volt supply uses a half-wave rectifier with an RC filter.

3.1 MAINTENANCE.

3.1.1 GENERAL.

Maintenance of the Low-Voltage Power Supply 429B-1 consists primarily of checking the line fuse and the rectifier diodes.

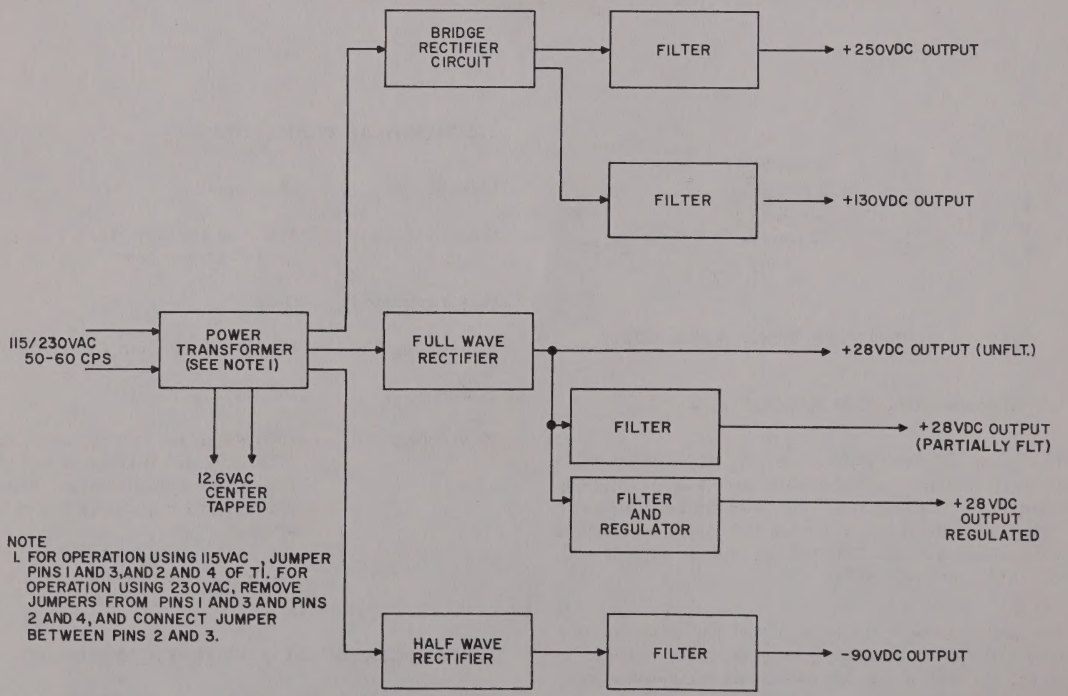
BRIDGE RECTIFIER CIRCUIT
FILTER
+250VDC OUTPUT
FILTER
+130VDC OUTPUT
115/230VAC 50-60 CPS
POWER TRANSFORMER (SEE NOTE 1)
FULL WAVE RECTIFIER
+28VDC OUTPUT (UNFLT.)
FILTER
+28VDC OUTPUT (PARTIALLY FLT)
FILTER AND REGULATOR
+28 VDC OUTPUT REGULATED
12.6VAC CENTER TAPPED
NOTE
1. FOR OPERATION USING 115VAC, JUMPER PINS 1 AND 3, AND 2 AND 4 OF T1. FOR OPERATION USING 230VAC, REMOVE JUMPERS FROM PINS 1 AND 3 AND PINS 2 AND 4, AND CONNECT JUMPER BETWEEN PINS 2 AND 3.
HALF WAVE RECTIFIER
FILTER
-90VDC OUTPUT
C220-29-3

Figure 2. Low-Voltage Power Supply 429B-1, Block Diagram

3.1.2 TEST EQUIPMENT REQUIRED.

The only test equipment required to maintain the low voltage power supply is a vacuum tube voltmeter (Hewlett-Packard 410-B or equivalent).

3.1.3 TROUBLE ISOLATION.

The trouble most likely to occur in the low voltage supply is a blown fuse. If trouble is suspected in the rectifiers, the diode forward resistance and the reverse resistance may be checked with a vtvm. The resistance, using the R-times-1 scale, should be as follows:

Forward - Approximately 5 ohms

Reverse - Infinite

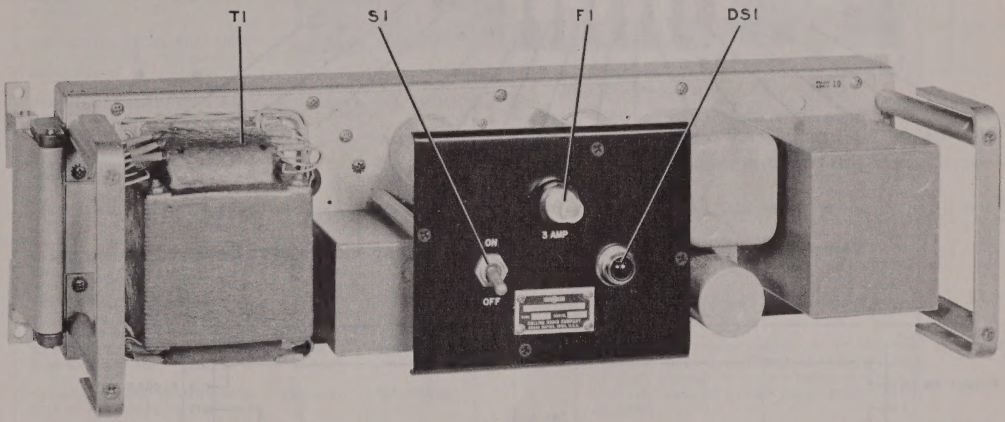

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Figure 3. Low-Voltage Power Supply 429B-1, Front View, Cover Removed

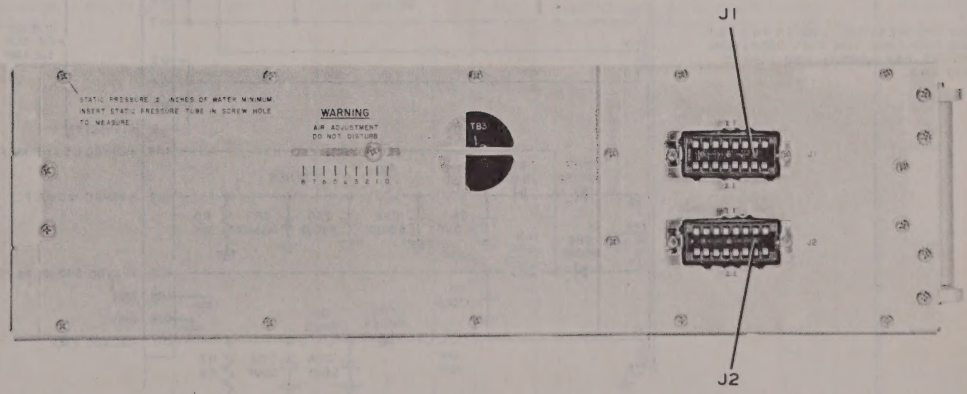

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Figure 4. Low-Voltage Power Supply 429B-1, Rear View

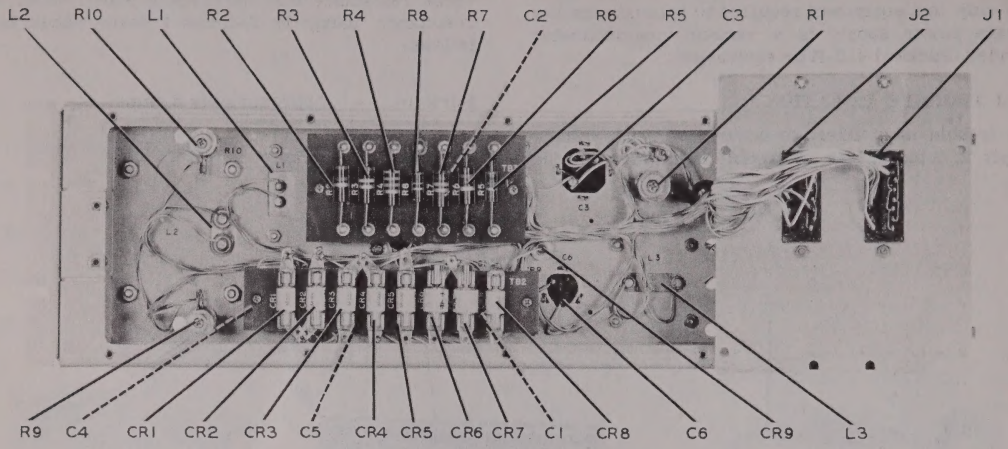

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Figure 5. Low-Voltage Power Supply 429B-1, Rear View, Cover Removed

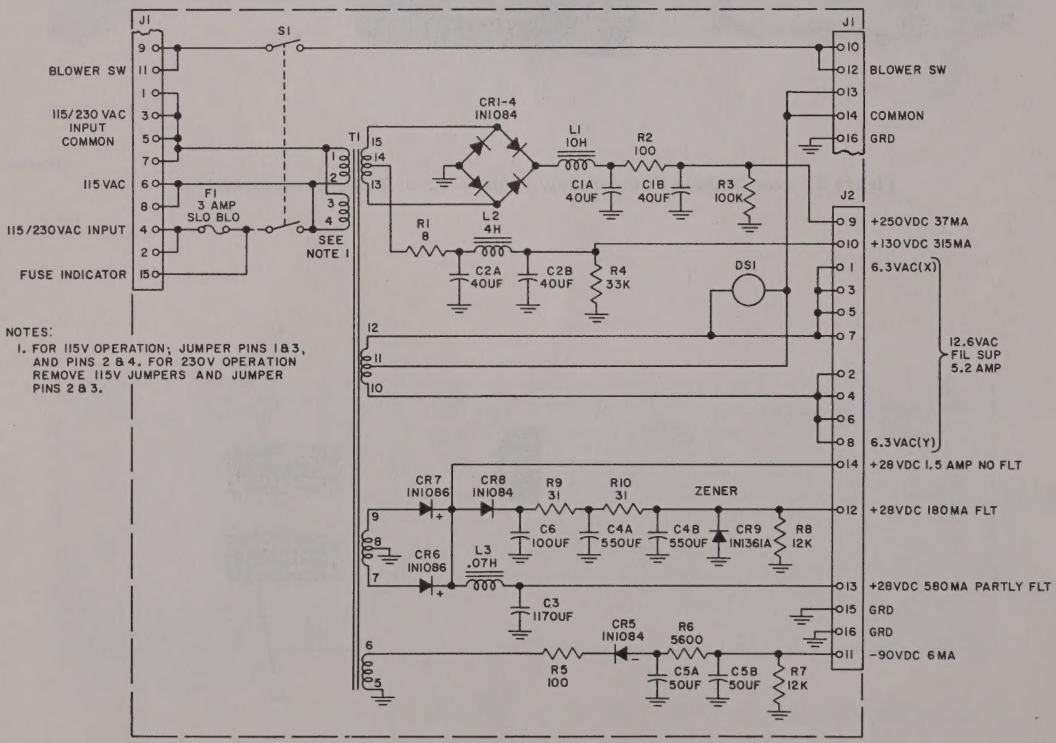

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Figure 6. Low-Voltage Power Supply 429B-1, Schematic Diagram

PARTS LIST

ITEM	DESCRIPTION	COLLINS PART NUMBER
	LOW-VOLTAGE POWER SUPPLY 429B-1	522 0862 003
C1	CAPACITOR, FIXED, ELECTROLYTIC: 2 sections; 450 vdc working, 40 uf ea section (includes C1A, C1B)	183 1009 00
C2	CAPACITOR, FIXED, ELECTROLYTIC: same as C1 (includes C2A, C2B)	183 1009 00
C3	CAPACITOR, FIXED, ELECTROLYTIC: 50 vdc working, 1170 uf	183 0014 00
C4	CAPACITOR, FIXED, ELECTROLYTIC: dual section, 50 volts, 550 uuf ea section, 1-3/8 in. dia by 3 in. lg	183 0338 00
C5	CAPACITOR, FIXED, ELECTROLYTIC: 2 sections; 200 vdc working, 50 uf ea section (includes C5A, C5B)	183 0680 00
C6	CAPACITOR, FIXED, ELECTROLYTIC: 100 v dc, 100 uf, plus 100% - 10%, metal case 1-7/64 in. dia by 2 in. lg	183 0241 00
CR1 thru CR5	SEMICONDUCTOR DEVICE, DIODE: silicon; type 1N1084	353 1567 00
CR6	SEMICONDUCTOR DEVICE, DIODE: silicon; type 1N1086	353 1558 00
CR7	SEMICONDUCTOR DEVICE, DIODE: same as CR6	353 1558 00
CR8	SEMICONDUCTOR DEVICE, DIODE: same as CR1	353 1567 00
CR9	SEMICONDUCTOR DEVICE, DIODE: zener; silicon; type 1N1361A	353 2625 00
DS1	LENS, INDICATOR LIGHT: 21/32 in. dia red w/smooth disk lens	262 2160 00
E1	TERMINAL, LUG: rd tongue shape; 0.018 in. by 5/16 in. by 23/32 in. overall	505 5038 001
F1	FUSE, CARTRIDGE: 3 amp, 250 vdc	264 4080 00
I1	LAMP, INCANDESCENT: 6.3 v, 0.945 w, 0.15 amps	262 3240 00
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: low loss plastic dielectric, 16 male contact, 5 amps at 600 vdc	372 1262 00
J2	CONNECTOR, RECEPTACLE, ELECTRICAL: low loss plastic dielectric, 16 female contact, 5 amps at 600 vdc	372 1264 00
L1	REACTOR: 1 coil, 10 hy, 60 ma dc, 250 ohms dc	678 0499 00
L2	REACTOR: 1 coil, 4.0 hy, 0.35 amp, 55 ohms ±10%	678 0390 00
L3	REACTOR: 1 coil, 0.07 hy, 750 ma dc, 3 ohms dc	668 0275 00
L4	NOT USED	
R1	RESISTOR, FIXED, WIRE WOUND: 8.0 ohms ±5%; 11 w	747 0209 00
R2	RESISTOR, FIXED, COMPOSITION: 100 ohms ±10%; 2 w	745 5610 00
R3	RESISTOR, FIXED, COMPOSITION: 100,000 ohms ±10%; 2 w	745 5736 00
R4	RESISTOR, FIXED, COMPOSITION: 33,000 ohms ±10%; 2 w	745 5715 00
R5	RESISTOR, FIXED, COMPOSITION: 100 ohms ±10%; 1 w	745 3310 00
R6	RESISTOR, FIXED, COMPOSITION: 5600 ohms ±10%; 2 w	745 5684 00
R7	RESISTOR, FIXED, COMPOSITION: 12,000 ohms ±10%; 2 w	745 5698 00
R8	RESISTOR, FIXED, COMPOSITION: 12,000 ohms ±10%; 2 w	745 3398 00
R9	RESISTOR, FIXED, WIREWOUND: 31 ohms p/m 5%, 11 w	746 6050 00
R10	RESISTOR, FIXED, WIREWOUND: same as R9	746 6050 00
S1	SWITCH, TOGGLE: dpdt; 28 vdc + 250 vac at 30 amp	266 3060 00
T1	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP: 230 v at 4.5 amp, 50 to 60 cps primary, 130 v at 0.025 amp, 70 v center tapped at 1.5 amp, 12.4 v at 5 amp, 230 v center tapped at 0.300 amp secondary	662 0278 00
TB1	TERMINAL BOARD: plastic; incl. 14 post terminals	542 7386 002
TB2	TERMINAL BOARD: plastic; incl 14 fuse clips, 16 lug terminals and 14 tubular rivets	542 7388 002
TB3	PLATE ADAPTER PRESSED: aluminum, chromate dip; 0.063 in. by 5-27/32 in. by 4-31/32 in.	544 2709 003
XF1	FUSE HOLDER: 250 v, 20 amp; accommodates one cartridge fuse	265 1040 00
XI1	LAMP HOLDER: accommodates miniature bayonet base incandescent lamp, 2 v, 0.06 amp	262 0093 00